AMENDMENT

UNMARKED VERSION

In the Claims:

Presented below are the claims, as amended, in a clean, unmarked format with changes entered and not marked. For the Examiner's convenience, all pending claims are presented herein. Claims that remain unchanged by this amendment are prefixed with "(Unchanged)."

Please amend claim 1, without prejudice, as follows.

Please add new claims 34 – 57.

1. (Twice Amended) A method comprising:

generating return scenarios for each asset class of a plurality of asset classes based upon future scenarios of one or more economic factors;

creating a mapping from each financial product of an available set of financial products onto one or more asset classes of the plurality of asset classes by determining exposures of the available set of financial products to each asset class of the plurality of asset classes;

determining expected returns and volatility of returns for each of a plurality of portfolios on the efficient frontier based upon the mapping, each of the plurality of portfolios including combinations of financial products from the available set of financial products; and

identifying a recommended portfolio of the plurality of efficient portfolios that maximizes an expected utility of wealth for a particular investor.

2. (Unchanged) The method of claim 1, wherein the expected returns and the volatility of returns for each of the plurality of portfolios on the efficient frontier are determined analytically.

1   3.   (Unchanged) The method of claim 1, wherein the expected returns and the

2   volatility of returns for each of the plurality of portfolios on the efficient frontier

3   are determined based upon a simulation process.

1   4.   (Unchanged) The method of claim 1, wherein the particular investor's utility

2   function comprises a mean-variance utility function.

1   5.   (Unchanged) The method of claim 1, wherein said identifying a recommended

2   portfolio assumes a constant-mix strategy.

1   6.   (Unchanged) The method of claim 1, wherein said identifying a recommended

2   portfolio assumes a buy-and-hold strategy.

1   7.   (Unchanged) The method of claim 1, wherein the available set of financial

           products represents a set of financial products offered through an employee-

           directed defined contribution plan.

1   8.   (Unchanged) The method of claim 7, wherein the available set of financial

2   products comprises one or more of bonds, stocks, and mutual funds.

1   9.   (Unchanged) The method of claim 1, wherein said generating return scenarios for

2   each asset class of a plurality of asset classes employs a model that incorporates a

3   stochastic process that limits the prices on the assets and payoffs in such a way

4   that no arbitrage is possible.

1   10.   (Unchanged) The method of claim 1, wherein the plurality of asset classes

2   includes a core set of asset classes and a set of factor asset classes, and wherein

3   the method further includes conditioning the factor asset classes upon the core

4   asset classes.

1 11. (Unchanged) The method of claim 10, wherein said conditioning the factor asset

2 classes upon the core asset classes employs the following equation:

$$r_{it} = \alpha_i + \beta_{1i}ST\_Bonds_t + \beta_{2i}LT\_Bonds_t + \beta_{3i}US\_Stocks_t + \varepsilon_t$$

4 where,

5 r_{it} represents the return for a factor, i, at time t,

6 β_{ji} represents the sensitivity of the factor i to core asset class j,

7 ST_Bonds_t represents the returns estimated for short-term US government bonds

8 at time t,

9 LT_Bonds_t represents the returns estimated for long-term US government bonds

10 at time t.,

11 US_Stocks_t represents the returns estimated for US stocks at time t,

12 α_i is a constant representing the average returns of factor asset class i relative to

13 core asset class exposures, and

14 ε_t is a residual random variable.

1 12. (Unchanged) The method of claim 11, further including imposing

2 macroconsistency upon the factor asset class returns by estimating α_i relative to a

3 known efficient portfolio.

1 13. (Unchanged) The method of claim 12, wherein said imposing macroconsistency

2 upon the factor asset class returns includes calibrating α_i to be consistent with

3 observed market weightings of the factor asset classes associated with the Market

4 Portfolio.

1 14. (Unchanged) A method comprising the steps of:

2 a pricing kernel step for generating return scenarios for each asset class of

3 a plurality of asset classes based upon future scenarios of one or more economic

4 factors;

5 a returns-based style analysis step for creating a mapping from each

6 financial product of an available set of financial products onto one or more asset

7 classes of the plurality of asset classes by determining exposures of the available

8 set of financial products to each asset class of the plurality of asset classes;

9 a step for determining expected returns and volatility of returns for each of

10 a plurality of portfolios on the efficient frontier based upon the mapping, each of

11 the plurality of portfolios including combinations of financial products from the

12 available set of financial products; and

13 a recommendation step for identifying a recommended portfolio of the

14 plurality of efficient portfolios that maximizes an expected utility of wealth for a

15 particular investor.

1 15. (Unchanged) The method of claim 14, wherein the expected returns and the

2 volatility of returns for each of the plurality of portfolios on the efficient frontier

3 are determined analytically.

1 16. (Unchanged) The method of claim 14, wherein the expected returns and the

2 volatility of returns for each of the plurality of portfolios on the efficient frontier

3 are determined based upon a simulation process.

1 17. (Unchanged) The method of claim 14, wherein the particular investor's utility

2 function comprises a mean-variance utility function.

1 18. (Unchanged) The method of claim 14, wherein said recommendation step

2 assumes a constant-mix strategy.

1 19. (Unchanged) The method of claim 14, wherein said recommendation step

2 assumes a buy-and-hold strategy.

1 20. (Unchanged) The method of claim 14, wherein the available set of financial

2 products represents a set of financial products offered through an employee-

3 directed defined contribution plan.

1 21. (Unchanged) The method of claim 20, wherein the available set of financial

2 products comprises one or more of bonds, stocks, and mutual funds.

1 22. (Unchanged) The method of claim 14, wherein said pricing kernel step employs a

2 model that incorporates a stochastic process that limits the prices on the assets and

3 payoffs in such a way that no arbitrage is possible.

1 23. (Unchanged) A method comprising:

2 estimating returns for each financial product of an available set of

3 financial products based upon the financial product's sensitivity to movements of

4 a plurality of predetermined economic factors by utilizing a factor model;

5 determining expected returns and volatility of returns for each of a

6 plurality of portfolios on the efficient frontier for the available set of financial

7 products, the plurality of portfolios each including one or more financial products

8 of the available set of financial products; and

9 identifying a recommended portfolio of the plurality of portfolios that

10 maximizes a particular investor's utility function at a predetermined time horizon

11 taking into consideration the timing and amount of expected contributions and

12 expected withdrawals, if any.

1 24. (Unchanged) The method of claim 23, wherein the expected returns and the

2 volatility of returns for each of the plurality of portfolios on the efficient frontier

3 are determined analytically.

1 25. (Unchanged) The method of claim 23, wherein the expected returns and the

2 volatility of returns for each of the plurality of portfolios on the efficient frontier

3   are determined based upon a simulation process.

1   26.   (Unchanged) The method of claim 23, wherein the utility function comprises a

2   mean-variance utility function.

1   27.   (Unchanged) The method of claim 23, wherein said identifying a recommended

2   portfolio assumes a constant-mix strategy.

1   28.   (Unchanged) The method of claim 23, wherein said identifying a recommended

2   portfolio assumes a buy-and-hold strategy.

1   29.   (Unchanged) The method of claim 23, wherein the available set of financial

2   products represents a set of financial products offered through an employee-

3   directed defined contribution plan.

1   30.   (Unchanged) The method of claim 29, wherein the available set of financial

2   products comprises one or more of bonds, stocks, and mutual funds.

1   31.   (Unchanged) A financial advisory system comprising:

2   a forecasting means for generating return scenarios for each asset class of

3   a plurality of asset classes based upon future scenarios of one or more economic

4   factors;

5   a fund decomposition means, communicatively coupled to the forecasting

6   means, for creating a mapping from each financial product of an available set of

7   financial products onto one or more asset classes of the plurality of asset classes

8   by determining exposures of the available set of financial products to each asset

9   class of the plurality of asset classes;

10   a means, communicatively coupled to both the forecasting means and the

11   fund decomposition means, for determining expected returns and volatility of

12   returns for each of a plurality of portfolios on the efficient frontier based upon the

13   mapping, each of the plurality of portfolios including combinations of financial

14   products from the available set of financial products; and

15   a portfolio optimization means for identifying a recommended portfolio of

16   the plurality of efficient portfolios that maximizes an expected utility of wealth

17   for a particular investor based on the expected returns and the volatility of returns.

1   32.   (Unchanged) A computer system comprising:

2   a storage device having stored therein a portfolio optimization routine to

3   determine portfolio return scenarios for one or more portfolios including

4   combinations of financial products from an available set of financial products and

5   identify a recommended portfolio;

6   a processor coupled to the storage device to execute the portfolio

7   optimization routine to generate asset class return scenarios, a mapping, portfolio

8   return scenarios, and identify the recommended portfolio, where:

9   the asset class return scenarios are generated for each asset class of

10   a plurality of asset classes based upon future scenarios of one or more

11   economic factors;

12   the mapping associates each financial product of the available set

13   of financial products with one or more asset classes of the plurality of

14   asset classes, the mapping is generated by determining exposures of the

15   available set of financial products to each asset class of the plurality of

16   asset classes;

17   the portfolio return scenarios are generated by determining

18   expected returns and volatility of returns for each of a plurality of

19   portfolios on the efficient frontier based upon the mapping, each of the

20   plurality of portfolios including combinations of financial products from

21   the available set of financial products; and

22   the recommended portfolio is identified by determining a portfolio

23   of the plurality of efficient portfolios that maximizes an expected utility of

24   wealth for a particular investor.

1   33.   (Unchanged) A machine-readable medium having stored thereon data

2   representing sequences of instructions, said sequences of instructions which,

3   when executed by a processor, cause said processor to:

4   estimate returns for each financial product of an available set of financial

5   products based upon the financial product's sensitivity to movements of a

6   plurality of predetermined economic factors by utilizing a factor model;

7   determine expected returns and volatility of returns for each of a plurality

8   of portfolios on the efficient frontier for the available set of financial products, the

9   plurality of portfolios each including one or more financial products of the

10   available set of financial products; and

11   identify a recommended portfolio of the plurality of portfolios that

12   maximizes a particular investor's utility function at a predetermined time horizon

13   taking into consideration the timing and amount of expected contributions and

14   expected withdrawals, if any.

1   34.   (New) A method comprising:

2   determining feasible exposures to a plurality of asset classes achievable by

3   a particular investor by determining a combination of one or more asset classes

4   and proportions thereof that characterize future performance of each financial

5   product of a set of financial products available to the particular investor for

6   investment; and

7   identifying a recommended efficient portfolio of financial products from

8   the set of financial products by maximizing an expected utility of wealth for the

9   particular investor based upon the feasible exposures.

1 35.   (New) The method of claim 34, further comprising modeling expected future

2   asset class returns as a function of one or more economic factors by generating

3   return scenarios for each asset class of the plurality of asset classes based upon

4   future scenarios of the one or more economic factors.

1 36.   (New) The method of claim 34, wherein said determining a combination of one

2   or more asset classes and proportions thereof that characterize future performance

3   of each financial product of a set of financial products comprises performing

4   returns-based style analysis.

1 37.   (New) The method of claim 34, wherein said determining a combination of one

2   or more asset classes and proportions thereof that characterize future performance

3   of each financial product of a set of financial products comprises surveying the

4   underlying assets held in the financial product.

1 38.   (New) The method of claim 34, wherein said determining a combination of one

2   or more asset classes and proportions thereof that characterize future performance

3   of each financial product of a set of financial products comprises obtaining

4   exposure information based on a target benchmark associated with the financial

5   product.

1 39.   (New) The method of claim 34, wherein said determining a combination of one

2   or more asset classes and proportions thereof that characterize future performance

3   of each financial product of a set of financial products comprises categorizing

4   exposures based on standard industry classification schemes.

1 40.   (New) The method of claim 34, further comprising forecasting the probability of

2   the particular investor meeting an identified financial goal based upon the

3   recommended efficient portfolio.

1 41. (New) The method of claim 34, further comprising receiving information

2   indicative of the particular investor's risk tolerance.

1 42. (New) The method of claim 41, wherein said maximizing an expected utility of

2   wealth for the particular investor comprises determining expected returns and

3   volatility of the expected returns for each of a plurality of efficient portfolios

4   comprising a combination of one or more financial products from the set of

5   financial products based upon said determining a combination of one or more

6   asset classes and proportions thereof that characterize future performance of each

7   financial product.

1 43. (New) The method of claim 34, wherein the set of financial products available to

2   the particular investor for investment comprises financial products offered

3   through an employee-directed defined contribution plan.

1 44. (New) A method comprising:

2   identifying a relationship between returns of each financial product of a

3   set of financial products that are available to a particular investor for investment

4   and returns of combinations of one or more factor asset classes of a set of factor

5   asset classes by performing an exposure analysis on each financial product of the

6   set of financial products;

7   determining expected returns and volatility of returns for each of a

8   plurality of efficient portfolios based upon the relationship, each of the plurality

9   of efficient portfolios including a combination of one or more of the financial

10   products from the set of financial products; and

11   identifying a recommended portfolio of the plurality of efficient portfolios

12   by selecting an efficient portfolio of the plurality of efficient portfolios that

13   maximizes an expected utility of wealth for the particular investor.

1 45. (New) The method of claim 44, further comprising:

2 forecasting returns associated with each core asset class of a set of core

3 asset classes by generating core asset class scenarios based upon future scenarios

4 of one or more economic factors with an equilibrium econometric model; and

5 forecasting returns associated with each factor asset class of the set of

6 factor asset classes by generating factor model asset scenarios based upon the core

7 asset class scenarios;

1 46. (New) The method of claim 44, wherein said performing an exposure analysis on

2 each financial product of the set of financial products comprises performing

3 returns-based style analysis.

1 47. (New) The method of claim 44, wherein said performing an exposure analysis on

2 each financial product of the set of financial products comprises surveying the

3 underlying assets held in the financial product.

1 48. (New) The method of claim 44, wherein said performing an exposure analysis on

2 each financial product of the set of financial products comprises obtaining

3 exposure information based on a target benchmark associated with the financial

4 product.

1 49. (New) The method of claim 44, wherein said performing an exposure analysis on

2 each financial product of the set of financial products comprises categorizing

3 exposures based on standard industry classification schemes.

1 50. (New) The method of claim 44, further comprising forecasting the probability of

2 the particular investor meeting an identified financial goal based upon the

3 recommended efficient portfolio.

1 51. (New) The method of claim 44, further comprising receiving information

2   indicative of the particular investor's risk tolerance, and wherein said maximizing

3   an expected utility of wealth for the particular investor takes into consideration

4   the information indicative of the particular investor's risk tolerance and

5   information regarding expected returns and volatility of the expected returns for

6   each of a plurality of efficient portfolios comprising a combination of one or more

7   financial products from the set of financial products that is generated based upon

8   the relationship.

1 52.   The method of claim 44, wherein the set of financial products available to the

2   particular investor for investment comprises financial products offered through an

3   employee-directed defined contribution plan.

1 53.   (New) A method comprising:

2   a step for determining feasible exposures to a plurality of asset classes

3   achievable by a particular investor based upon a set of financial products available

4   to the particular investor for investment; and

5   a step for identifying a recommended efficient portfolio of financial

6   products from the set of financial products.

1 54.   (New) The method of claim 53, further comprising a step for modeling expected

2   future asset class returns as a function of one or more economic factors;

1 55.   (New) A method comprising:

2   a step for identifying a relationship between returns of each financial

3   product of a set of financial products that are available to a particular investor for

4   investment and returns of combinations of one or more factor asset classes of a set

5   of factor asset classes;

6   a step for determining expected returns and volatility of returns for each of

7   a plurality of efficient portfolios based upon the relationship, each of the plurality

8   of efficient portfolios including a combination of one or more of the financial

9   products from the set of financial products; and

10   a step for identifying a recommended portfolio of the plurality of efficient

11   portfolios.

1 56. (New) The method of claim 57, further comprising:

2   a step for forecasting returns associated with each core asset class of a set of core

3   asset classes by generating core asset class scenarios based upon future scenarios of one

4   or more economic factors with an equilibrium econometric model; and

5   a step for forecasting returns associated with each factor asset class of the set of

6   factor asset classes based upon the core asset class scenarios

1 57. (New) A method comprising:

2   forecasting returns associated with each core asset class of a set of core asset

3   classes by generating core asset class scenarios based upon future scenarios of one or

4   more economic factors with an equilibrium econometric model;

5   forecasting returns associated with each factor asset class of a set of factor asset

6   classes by generating factor model asset scenarios based upon the core asset class

7   scenarios;

8   identifying a relationship between future returns of each financial product of a set

9   of financial products that are available to a particular investor for investment and future

10   returns of combinations of one or more factor asset classes of the set of factor asset

11   classes by determining each financial product's effective asset mix with respect to the set

12   of factor asset classes;

13   determining expected returns and volatility of returns for each of a plurality of

14   efficient portfolios based upon the relationship, each of the plurality of efficient

15   portfolios including a combination of one or more of the financial products from the set

16   of financial products; and

identifying a recommended portfolio of the plurality of efficient portfolios by

selecting an efficient portfolio of the plurality of efficient portfolios that maximizes an

expected utility of wealth for the particular investor.